F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

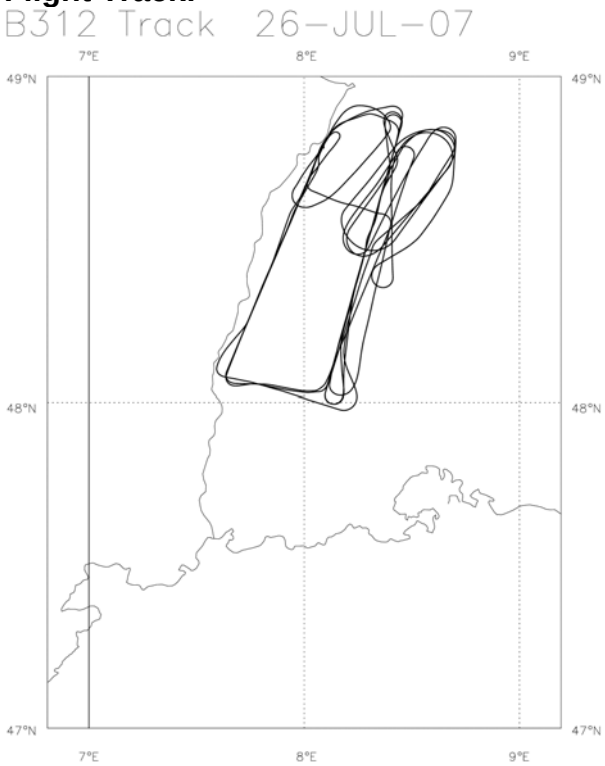
Flight No.:	B312
Date:	26 July 2007
Take Off	10:52:34Z
Landing:	15:24:19Z
Flight Time	4h31m45s

Campaign: COPS

Operating Area: Baden-Baden, Germany

POB	Position	Name	Institute
1	Captain	Al Foster	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM 1	Dawn Quinn	Directflight
4	Mission Scientist 1	Hugh Coe	University of Manchester
5	Flight Manager	Mo Smith	FAAM
6	Cloud Physics / CDP	Kate Turnbull	FAAM
7	Core Chemistry / CCM2	Doug Anderson	FAAM
8	VACC 1	Angela Dean	Leeds University
9	CPI 1	James Dorsey	University of Manchester
10	CPI 1	Martin Gallagher	University of Manchester
11	CVI	James Bowles	Met Office
12	Nephelometers / PSAP	Dave Tiddeman	Met Office
13	AMS	Will Morgan	University of Manchester
14	Mission Scientist 2	Keith Bower	University of Manchester
15	Mission Scientist 3	Justin Peter	Leeds University
16	Mission Scientist 4	Alan Gadian	University of Manchester
17	Mission Scientist 5	Stephen Mobbs	Leeds University
18			
19			
20			

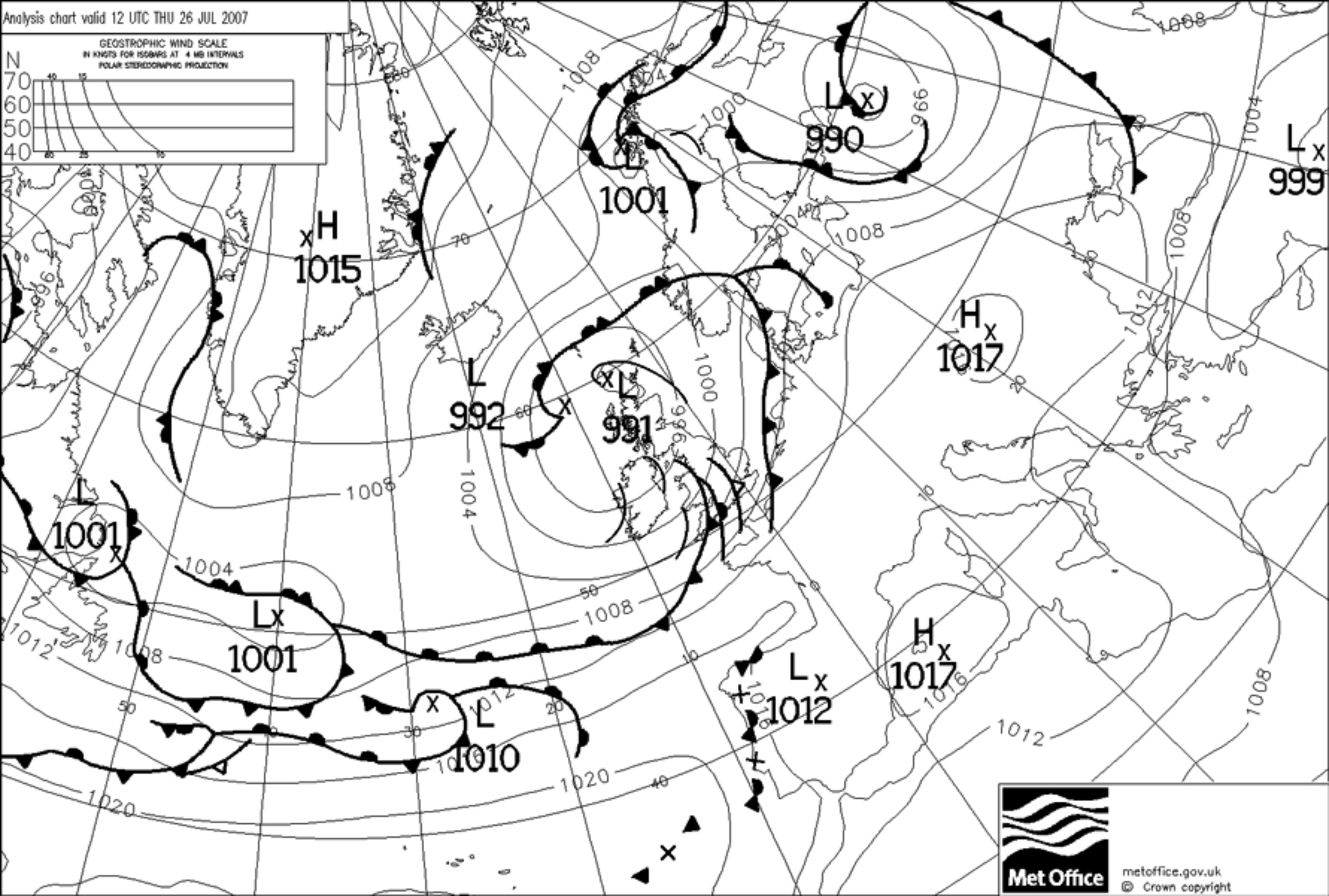
Flight Track:



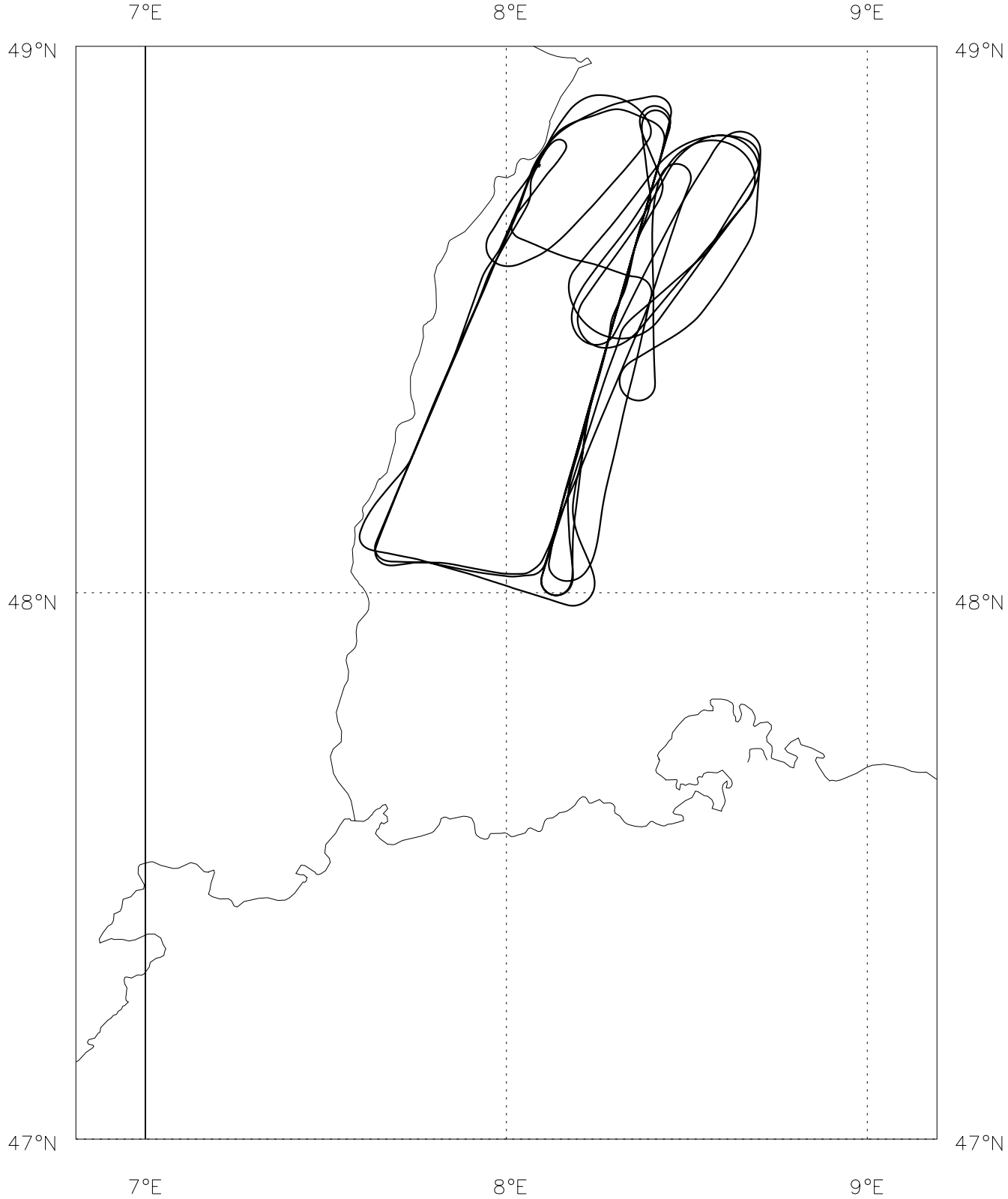
FLIGHT SUMMARY

Flight No B312
Date: 26 July 2007
Project: COPS
Location: Baden Baden

Start Time	End Time	Event	Height (s)	Hdg	Comments
093625		Start-Up	0.35 kft	151	8'46.90N, 8'05.35E
105234		T/O	6.0 kft	042	Baden Baden
110030		Videos	6.0 kft	040	Start FFC & UFC
110150	110452	Profile 1	6.0 - 2.5 kft	336	6k', Q1015 2.5k'
110452	111939	Run 1	2.5 kft	215	2.5k'
112051	112354	Profile 2	2.5 - 5.4 kft	085	A-B, 2.5-5.5k'
112524	113710	Run 2	5.5 kft	018	B-C, 5.5k'
113811	114122	Profile 3	5.5 - 2.5 kft	288	5.5-2.5k' to Baden
114123	115515	Run 3	2.5 kft	218	W abeam A
115313		Event	2.5 kft	221	Deviate west
115556	120140	Profile 4	2.5 - 9.4 kft	112	2.5-FL95 to B
120339	120741	Profile 5	9.5 - 5.5 kft	333	Towards C
120742	121555	Run 4	5.5 kft	014	Towards C
121653	122025	Profile 6	5.5 - 2.5 kft	260	C to Baden
122025	123420	Run 5	2.5 kft	216	Baden to A
123140		Videos	2.5 kft	203	Change tapes
123515	123814	Profile 7	2.4 - 5.4 kft	097	A-B
123949	125048	Run 6	5.5 kft	025	B-C, 5.5k'
124721		Event	5.5 kft	018	Over Murg Valley Site
125339	125806	Profile 8	5.5 - 9.5 kft	183	From 5.5k' twds M Q1014
125559		Event	7.6 kft	184	Over Murg Valley Site
130055	130354	Profile 8	9.5 - 12.0 kft	058	
130216		Event	10.8 kft	047	Into dust layer
130409	130701	Profile 8	12.0 - 14.5 kft	028	
130834	131401	Profile 8	14.5 - 20.0 kft	220	
131619	131827	Profile 8	20.0 - 22.0 kft	026	More plumes above
131844	132259	Profile 8	22.0 - 26.0 kft	028	
132323	133458	Profile 9	26.0 - 15.0 kft	223	
133521	133635	Profile 10	15.5 kft	212	
133736	134347	Run 7	15.5 kft	219	In the dust
134404	134459	Profile 11	15.4 - 14.6 kft	037	
134500	134953	Profile 11	14.6 - 10.0 kft	035	
134953	135459	Run 8	10.0 kft	216	In dust layer
135436		Event	10.0 kft	231	Over Murg Valley Site
135459	135953	Profile 12	10.0 - 5.5 kft	231	In dust layer 5.5k' Q1013
135954	140324	Run 9.1	5.5 kft	199	5.5k' Q1013
140503	141735	Run 9.2	5.5 kft	007	
140631		Videos	5.5 kft	005	Change tapes
141921	143343	Run 10	5.0 kft	180	5k' , C-B
143525	144824	Run 10.2	5.0 kft	003	B-C
145017	150415	Run 11	5.5 kft	169	C-B, 5.5k',Q1013
151107	151810	Run 12	5.5 - 5.6 kft	012	Supersites,5.5k' Q1012
151319		Event	5.6 kft	013	Over Murg Valley Site
151605		Event	5.6 kft	278	Over Hornisgrinde
151753		Event	5.6 kft	288	Over Achern site
152419		Land	0.45 kft	045	Baden Baden
152916		Shutdown	0.45 kft	160	48'46.91N, 8'05.35E


Analysis chart valid 12 UTC THU 26 JUL 2007
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L
990
L
1001
L
999
H
1015
L
992
L
991
H
1017
L
1001
Lx
1001
L
1010
Lx
1012
H
1017
1008
1004
1000
996
1012
1020
Met Office
metoffice.gov.uk
© Crown copyright

B312 Track 26-JUL-07



Scientific Aims: The goal of UK-COPS is to determine the properties of the aerosols that will likely be ingested into the convective clouds that form over the Black Forest mountains and to understand the formation and growth of ice and precipitation in these clouds . We wish to examine:

- the properties of the representative aerosol particles in the clear air that are transported into the convective clouds
- the concentration and size of cloud droplets just above cloud base
- the formation of the first ice due to primary nucleation on ice nuclei (IN)
- the development of ice via secondary processes such as the Hallett-Mossop process, in which new ice particles are generated during the riming growth of ice particles
- other secondary ice production processes, such as evaporative break-up;
- the production of supercooled raindrops and their role in the glaciation process
- the dependence of these processes on the dynamics of the cloud
- the production of precipitation

There will either be 2 flights per day: one in clear air to measure the properties of the aerosols and one later in the convective clouds; or the two parts will be flown in a single flight. Measurements will be made in cumulus clouds when their tops are about 0°C through to when the tops have grown to about -20°C.

Weather conditions:

Developing showers over the Black Forest mountains, Germany, within Box A and probably B.

Safety: Regions that paint RED on the aircraft weather radar should be avoided. No flight into clouds known to be producing lightning. There may be coordination with the DO-128 in Boxes A and B. The French and German Falcons may also be operating in the area.

Key instruments and their operation:

Basic meteorology

- Rosemount temperatures, GE hygrometer
- GPS, INU, turbulence probe. When in supercooled liquid water, Flight Manager or PIs should monitor turbulence probe and calibrated differential pressures for signs of icing (cessation of variability on signal).

Cloud Physics/Aerosol

- FFSSP, 2DC, 2DP, PCASP, CDP, CIP, SID-1 and SID-2. Normal monitoring to ensure correct operation. Operator should note particular features of interest eg. high concentrations, appearance of pristine ice crystal habits, appearance of large drops ($d > 100$ μm) in 2D imagery when above freezing level.
- CPI as above
- J-W LWC and Nevzorov LWC/TWC. Where straight/level and in clear air, these should be zeroed/calibrated and a note made in the Flight Managers log.
- TWC - profile ascents/descents should avoid cloud if possible
- AMS -
- CVI - below cloud base, normal operation is in aerosol mode; above cloud base, normal operation is in CVI mode
- VACC - in straight and level clear-air, 10 min runs; during cloud work and profiles, single temperature.

Sortie Brief:	**COPS** – Convective and Orographically-induced Precipitation Study FINAL
Flight Number:	B312
Date:	26 July 2007
Mission Scientists:	Hugh Coe, Keith Bower
TO Time:	12:50 local
Box activated:	14-17 local
Other a/c:	Possible: DO-128 (Coord with 146) and French Falcon and DLR Falson

Sortie Aims: To measure properties of aerosols in the clear air and the dev of convective clouds.

Sortie Location: Clear air in Rhine Valley and in convective clouds over B. F. mountains. Leg over supersites.

Sortie Summary:

1. Characterise properties of aerosols in clear air at low levels.
2. Penetrate cumulus clouds preferably near the top of the cloud in the updraught. All cloud penetrations should be with *wings level*. Two principal options are:

   A. stationary cloud or system of clouds;

   B. several cumulus clouds either in area (low wind) or passing through the area.
3. Characterise properties of aerosols in detrainment layers around cloud.
4. Overfly supersites M, H and R.

Sortie Detail:

1. Out-of-Cloud: All changes in altitude at standard rates (1000 ft/min).
   2 x Rhine Valley aerosol legs (70 mins)
2. Cloud work:

   Note an important feature is to ascend with tops. This requires a non-standard ascent as fast as possible. Contact DO-128 on COPS frequency. Relay cloud top info to the DO-128.

   Option A: Isolated developing clouds – ascend with the clouds near their top. All penetrations at constant altitude.

   A.1 Proceed to about 0°C or top of cloud.
   A.2 Adjust altitude to about 1000 ft below cloud top and penetrate cloud. The penetration should be made at a constant azimuth and altitude if possible. It is important to penetrate the growing turret in the updraught region. A few seconds after clearing cloud, turn and ascend for return to same region of cloud as quickly as possible using procedure turn.
   A.3 Repeat A.3, ascending with the top (if appropriate) at the end of each penetration out of cloud, until FL200 or FL240, or cloud becomes too developed.
   A.4 Repeat A.1 - A.4 for a new developing cumulus, go to **Option B**, or exit box.

   Option B: Many developing cumulus clouds – sample clouds at constant altitude.

   B.1 Proceed to 0°C
   B.2 Commence 10 min runs (turning where appropriate) in along shear direction. Adjust track to randomly sample the updraught regions of growing turrets.
   B.3 Ascend to -5°C (i.e. approximately 3500 ft) and repeat above for 10 min.
   B.5 Repeat for -10°C, -15°C and -20°C if possible.

3. Detrainment layers

   Proceed to level where cloud is being detrained from cloud and either make penetrations or circle around the cloud.
4. Leg over supersites Murg Valley (M), Hornisgrinde (H) and Achern (R) at about 5500 ft if in clear air. (15 min). Please make SATCOM phone call to A: Stephen's mobile (0163 8064064) and B: Ops Centre (07229 66 2550, or 2551) 15 mins before overpass of Supersites.

Mission Scientist's Debrief Sheet

"A mayhem of Mission Scientists"

Flight B312 26th July 2007

Summary of the weather conditions:
The high pressure ridge that built over the COPS region on the 25th July moved eastward towards central Europe. The centre of a low pressure system positioned over the UK and an associated front was over France during the day. In the morning before the flight the atmosphere was cloud free. Soundings suggested that the mid level troposphere was convectively unstable, should convection develop it was likely to propagate rapidly to 200 mbar. However, several inversions at low level and a dry incursion indicated that convection may have been inhibited later that day. Bets were taken as to whether convection would be initiated in the afternoon and Dr Gadian broke the bank and placed a euro on convection, a poor investment as it turned out. The flight took off in clear air, with only a very few cumulus clouds over the hills. These did not develop during the flight and dissipated. Upper level cloud was visible to the west by the end of the operating period in advance of the frontal system.

Scientific Aims;
The flight aimed to probe the possibility of vigorous convection over the western edge of the Black Forest region to the east of the Rhine that may develop throughout the afternoon. The microphysical properties of the developing clouds were to be probed as they developed with time. Aerosol characterisation legs in the Rhine valley were also to be conducted to characterise the aerosol input into the Black Forest valleys feeding the convective clouds.

Points defined:
Point EDSB (48 46' 8"N, 8 4' 8"E) Karlsruhe/Baden-Baden; Point A (48 05'N, 7 38'E); Point B (48 2'N, 8 6'E); Point C (48 51'N, 8 27'E); predefined box A and B were activated between 1300Z and 1600 Z.

Summary of the flight:
An initial low level leg over the central Rhine Valley between EDSB and Point A was conducted. The profile showed that a strong inversion was present at 5000' over the Rhine valley and the air was very dry above that level. The aerosol loading was moderate down the run from EDSB to point A with scattering coefficients between 30-40 Mm^{-1}. The majority of the aerosol appeared to be organic in composition. The leg from point B to point C showed that the aerosol and pollution was correlated with venting from the BL as shown by the in situ thermodynamic data. Two circuits of the legs EDSB-A-B-C were carried out. No convective cloud was observed to penetrate this dry layer and the cloud appeared to be dissipating. A profile was conducted above point B during the second circuit to the maximum permissible altitude of 9500'. This showed that the dry layer was not diminishing and it appeared unlikely that convective activity would develop in the afternoon. However, the profile showed the presence of a layer of large particles, probably dust, in a layer centred at 7000', a further layer was was observed to be present above. A third circuit of EDSB-A-B-C was conducted and on completion the predefined boxes A and B were entered from 5500' to allow a profile climb through the dust layers. This was above the ARM site in the Murgtal Valley. Three dust layers at 7500', FL100 and FL130 were present. These layers were very dry and showed no correlation with any pollution tracer. Above these several pollution layers were present. Each of these was thin but the nephelometer showed the particles were small and were correlated with CN and CO. The profile was terminated at FL260. On the descent, one of the pollution layers and one of the dust layers were penetrated (SLRs at FL155 and FL100). After descent out of box A, a series SLRs along the ridge line B-C were conducted in both S-N and N-S directions to sample mixing along the hill crest. Two of these runs were conducted at 5000' and two at 5500'. Valley pollution containing air with high O3 and secondary particles was shown to be highly correlated with the updrafts which contained warm, moist air. A single mixing line was observed along this run and there was some evidence of fine particle enhancement in the cleaner air aloft. A run above the supersites was conducted before landing.

Hugh Coe 27/7/07

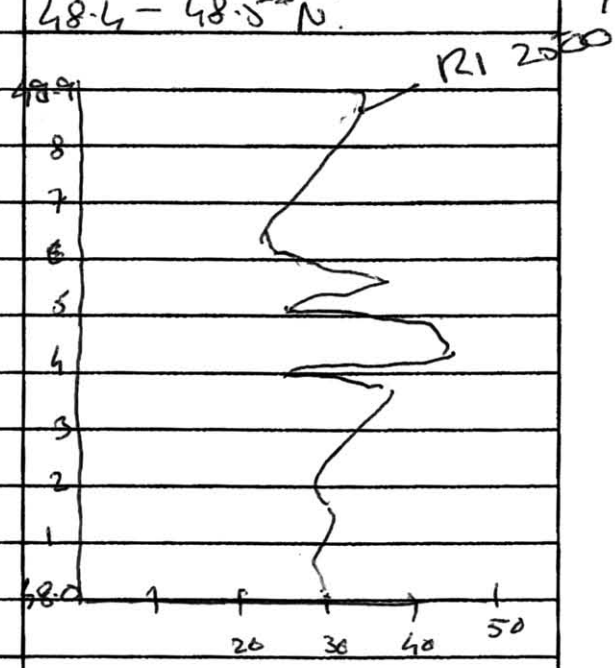
Mission Scientist's Log

Flight No B312 **Date** 26/7/07 **Name** HUGH COE **Page** 1 **of** 6

Time (Z)	Run	Altitude (ft)	Wind direction/speed °/kts	Position	Comments
		PRE FLIGHT PLANNING MEETINGS:			DLR FALCON 0845 UT (ABB)
					F FALCON 0800 UT (BB)
					DO128 0900 UT (BB)
					BAE 1050 UT (BB).
					BOX 12Z -15Z. ~~[illegible]~~
					ACTIVE
					Pre Take off: Gaelic in pos Jasso – typical
10:54Z.					T/O.
					Up to 7000ft for ~~[illegible]~~ into
					cloud free mostly sea very
					small Cu over hills of B Forêt
					but small.. Cums now
					building to E ahead of
					the advancing front as
					yesterday's high press ridge
					moves to east.
					Very little overhead cloud
					at moment.
					Convective cloud more
					vigorous over Vosges but
					still not at present
					~~[illegible]~~ penetrating the inversion.
	A				→ 2500ft to SE
	RUN1	2560ft	21[illegible] 3m/s Hdg 211°	Past BB	~~[illegible]~~ 2500ft SB → Pt A

Mission Scientist's Log

Flight No B. 312 **Date.** 26/7/07 **Name** ...HUGH COE..... **Page** 2 **of** 6

Time (Z)	Run	Altitude (ft)	Wind direction/speed °/kts	Position	Comments
11:08:43					Large inversion at 5000'.
					Very dry immediately above
11:17:33					Running down Rhine at
					2500ft nephelometer soot
					shows light load blue ~30
					-40 Mm^{-1} up to 45 ahead
					48.4 – 48.5°N.
					
11:19:39	END R1	2500ft	240° 2m/s	48°N	
				7°36'E	
11:20:51	R2		213° 8m/s.	A→B	A→B at 5500'
11:23:21	end R2	5500ft			5500 at point B
11:25:21	R2	5500ft		48°N	now heading N B→C
				8°56'E	
					The dewPT/T shows curved with ascent then
11:37:10	R2 end	5500ft			Point C end of run.
					Stepped along top of inversion at all the way along the run seeing intermittent wafting of warm air

Mission Scientist's Log

Flight No B. ~~132~~ 312 **Date.** 26/7/07 **Name** HUGH COE **Page** 3 **of** 6

Time (Z)	Run	Altitude (ft)	Wind direction/speed °/kts	Position	Comments
11:38:[illegible]	P3	5500 - 2800 ft			Part C → BB descent
					Remains of area CAPE
					region but cloud
					developing to NE of
					box A and also over Vargas
11:41:23	end R3 start R3	2800 ft	Hdg 214	~~Part A~~	Now at BB ~~descent~~ S down Rink
			11 4m/s dd 228	B.B.	
					Hang Gliders getting little
					lift.
11:51Z					Decided to profile from
					part A to B aiming at
					B at 9500 ft.
					So altered R3 to East
					a little so can start a
					profile to 9500 from
					2800 ft above Point B.
11:55:38	end R3	2800'		37 04.7 E	A little W of Point A
11:55:54	PS start	2800 to FL095			
					Aerosol in SLR R3 similar
					to R1 but without
					2 plumes.
12:01:44	PS end	FL095 → 2800			end profile descent
					profile again to Part B

Mission Scientist's Log

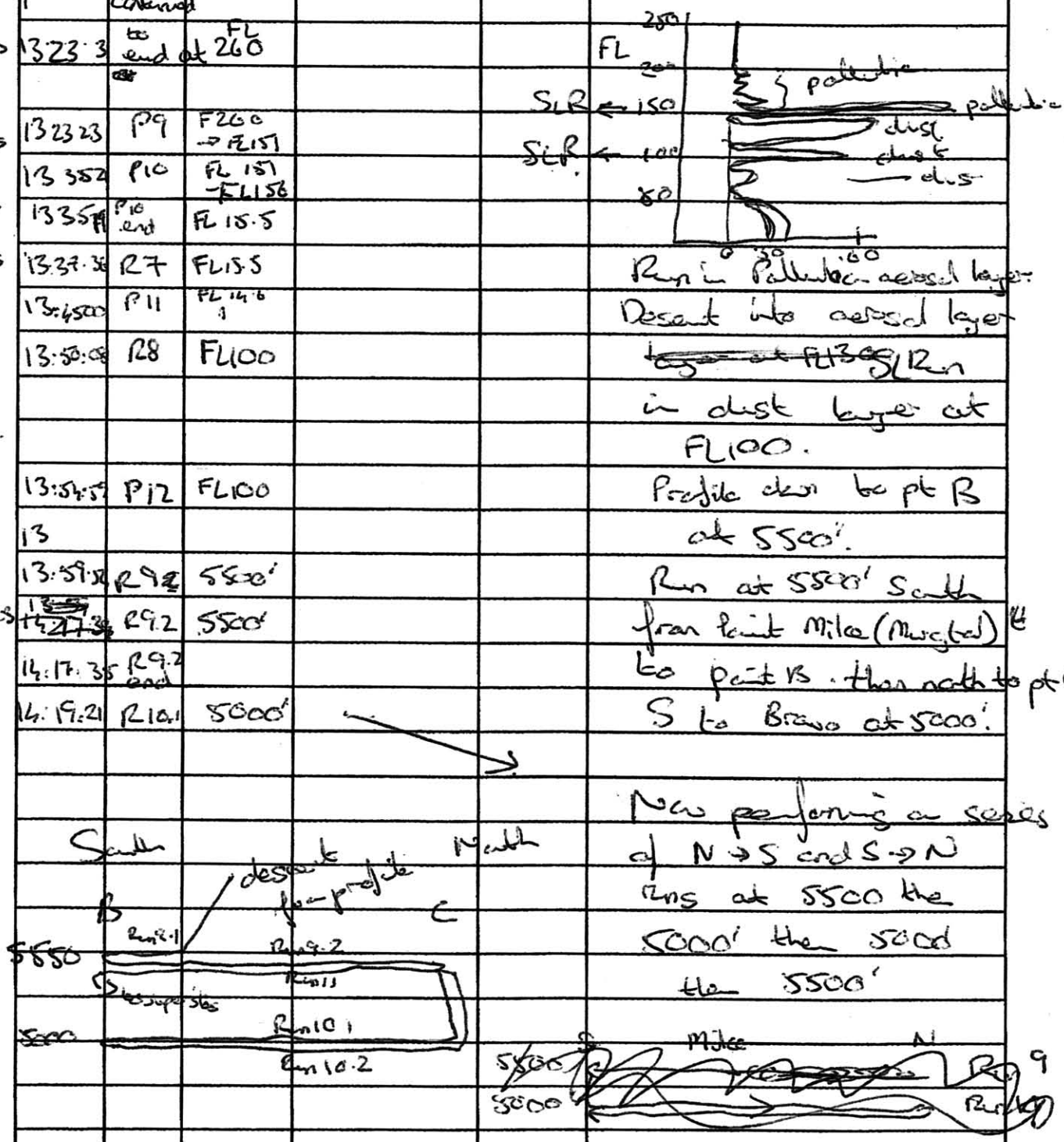
Flight No B312 **Date** 26/7/07 **Name** HUGH COE **Page** 4 **of** 6

Time (Z)	Run	Altitude (ft)	Wind direction/speed °/kts	Position	Comments
12:07:~~47~~	R4	5500ft			B→C. northwards up B forest
12:15:55	R4 end P6				
12:16:53		5500–2500ft			for– C to BB
12:20:28	R5	2500ft			for– BB to A
12:24:19	END R5	2500ft	11/6 m/s 22.4 m/s	POINT A	Now very clear Cu dissipating
12:35:14	P7	2500 – 5500		PT A → PT B	few cumis dust layer still vis but thin.
					noph scatter ~
					low 25–30 Mm^{-1} (blue)
					mainly organics but
					secondary and vary on
					B. forest legs
					Also CN correl with O_3
					and Td showing detachment
					out of valleys in B forest.
12:38:14	end P7	5500 ft	T 12.4C 11/6 m/s T_d 6.77 dd 213	PT B.	Heading N.
					still low towards
12:39:49	R6	5500ft			Murgtal and then
					perform a profile to 9500ft
					above dust layer
					Remains clear overhead
					but some Cu over hills
					though no penetration.
12:47:21		5500ft		LON SE	Overhead Murgtal Valley site.
12:53:39	P8	5500ft – 9500ft			Profile through Mixed (Murgtal Valley Side) site and hopefully dust layer at 7000 ft

Mission Scientist's Log

Flight No B312 **Date.** 27/7/97 **Name** ....HIGHCCE.....

Time (Z)	Run	Altitude (ft)	Wind direction/speed °/kts	Position	Comments
13:03:06	P8 end	9800			Vert profile
13:08:55	P9				Cascade Structure
1	Colonia				
13:23:3	to end	FL 260			
13:23:23	P9	F260 → FL151			
13:35:2	P10	FL 151 → FL156			
1335	P10 end	FL 15.5			
13:37:3	R7	FL155			Run in Pollutes aerosol layer
13:45:00	P11	FL 14.6			Descent into aerosol layer
13:50:08	R8	FL100			~~Layer at FL130~~ SLRun
					in dust layer at
					FL100.
13:54:5	P12	FL100			Profile down to pt B
13					at 5500'.
13:59:X	R9.1	5500'			Run at 5500' South
14:05:05 ~~14:24:39~~	R9.2	5500'			from Point Mike (Mugital) to point B. then north to pt C
14:17:35	R9.2 end				
14:19:21	R10.1	5000'			S to Bravo at 5000'.
					Now performing a series
					of N→S and S→N
					runs at 5500 the
					5000' then 5000
					then 5500'



Mission Scientist's Log

Flight No B312 **Date** 26/7/07 **Name** MUGHEE **Page** 6 **of** 6

Time (Z)	Run	Altitude (ft)	Wind direction/speed °/kts	Position	Comments
14 33 43	R10 1 end	5000 ft	Hdg 3° 6 ms⁻¹		end
14 35:25	R10.2	5000 ft	T 14.9C Td 4.5C		leg B to C at 5000'
			217 deg.		
14:48:24	R10.2 end	5000 ft			N/W at part C.
14:50:14	R11	5500 ft			Part C south to part B
					In these legs the
					Hdeng vs q mains
					lies are straight
					and clear; the pollutio
					follows the con moist
					air and there is considerable
					variability in the vertical
					wind speed. Along leg
					that is consistent over
					all four runs.
					The aerosol is secondary
					in native agit is
					piped out of valley
15:04:15	R11 end				up to 7500' for
					safety pre landing
					then descend to 5500'
					for Superite overpass
15:11:07	R12	5500 ft			~~15~~
~~15~~		5500 ft			Overpass Mica (Mystal)
15:		5500 ft			Overpass Harrogate
15:18:10	end of run 12.	5500 ft			Overpass Aden.
15:25			T/D.		

end of project. Science

CLOUD PHYSICS LOG Flight B312

Date: 26/07/07	Operator: KFT	DRS Time: 09:35:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 1 of 1

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
10:54:45	293	0.08	4	5	1	0		0									FL035
10:55:28	165	0.08	4	2	0	0		0									FL050
10:56:03	23	0.07	4	0	0	0		0									FL060
11:01:30	218	0.08	5	1	0	0		0									
11:02:33	352	0.08	5	8	0	0		0									FL050
11:03:22	343	0.08	5	2	1	0		0									FL040
11:04:12	750	0.08	5	5	1	0		0									FL030
11:04:52	607	0.08	5	8	0	0		0									FL025 START RUN 1
11:07:00	621	0.08	5	2	0	0		0									FFSSP base value increased
11:10:00	607	0.08	5	2	1	0		0									FFSSP SYNCH'ED
11:15:00	601	0.08	6	2	1	0		0									
11:17:00	490	0.08	6	5	1	0		0									
11:19:00	558	0.08	7	5	1	0		0									
11:19:39	561	0.08	7	2	1	0		0									END RUN 1 @FL025
11:20:51	585	0.08	7	10	1	0		0									START PROFILE 2
11:21:25	565	0.08	7	5	1	0		0									FL030
11:22:28	673	0.09	8	8	0	0		0									FL040
11:23:24	434	0.08	8	2	1	0		0									FL050
11:23:53	377	0.08	8	2	0	0		0									FL055 END PROFILE 2 AT B
11:25:25	484	0.08	8	5	0	0		0									START RUN 2
11:27:00	339	0.09	8	7	0	0		0									AMS seeing lots
11:29:00	103	0.07	8	0	0	0		0									
11:31:00	314	0.09	8	2	1	0		0									PCASP v variable
11:33:00	96	0.09	8	8	1	0		0									
11:35:00	363	0.08	8	2	1	0		0									
11:37:12	351	0.08	9	5	0	0		0									END RUN 2 @ C
11:38:11	118	0.08	9	7	1	0		0									START PROFILE 3 FL055
11:39:40	300	0.08	9	2	1	0		0									FL040
11:40:43	555	0.08	9	8	1	0		0									FL030
11:41:24	567	0.08	9	3	1	0		0									END P3 @ B FL025 START RUN 3
11:43:00	282	0.08	9	2	1	0		0									
11:45:00	578	0.08	9	5	1	0		0									
11:47:00	609	0.08	9	2	1	0		0									
11:49:00	521	0.08	10	5	1	0		0									11:50 2DC IMAGE - NOISE
11:51:00	515	0.08	10	2	0	0		0									
11:53:00	496	0.08	10	2	0	0		0									
11:55:00	492	0.08	11	5	1	0		0									END RUN 3 W of A
11:56:21	653	0.08	11	5	1	0		0									FL030
11:57:10	399	0.08	12	8	0	0		0									FL040
11:58:02	33	0.06	12	0	0	0		0									FL050
11:58:51	22	0.07	12	0	0	0		0									FL060
11:59:43	28	0.08	12	2	1	0		0									FL070
12:00:31	9	0.10	12	0	0	0		0									FL080
12:01:17	11	0.07	12	0	0	0		0									FL090
12:01:40	17	0.08	12	0	0	0		0									FL095 END PROFILE 4
12:03:38	23	0.07	12	1	1	0		0									START PROFILE 5

CLOUD PHYSICS LOG Flight B312

Date: 26/07/07	Operator: KFT	DRS Time: 09:35:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 2 of 2

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
12:04:30	33	0.08	12	0	0	0		0									FL090
12:05:11	22	0.10	12	9	0	0		0									FL080
12:06:10	17	0.07	12	2	0	0		0									FL070 BRIEF SPELL OF R=0.14 PCASP
12:07:01	70	0.08	12	1	0	0		0									FL060
12:07:42	150	0.07	12	0	1	0		0									FL055 END P5, START RUN 4
12:09:00	302	0.08	13	2	1	0		0									
12:11:00	235	0.08	13	2	1	0		0									
12:13:00	268	0.08	13	8	1	0		0									
12:15:00	396	0.08	13	5	0	0		0									
12:15:55	320	0.09	13	2	2	0		0									END RUN 4
12:16:53	141	0.08	13	0	0	0		0									START PROFILE 6 @ FL055
12:17:27	332	0.08	13	2	0	0		0									FL050
12:18:33	341	0.08	13	2	1	0		0									FL040
12:19:40	585	0.08	13	2	1	0		0									FL030
12:20:24	467	0.08	13	7	0	0		0									FL025 END P6, START R5
12:22:00	562	0.08	13	7	1	0		0									
12:24:00	639	0.08	13	5	1	0		0									
12:26:00	539	0.08	14	8	1	0		0									
12:28:00	450	0.08	15	7	1	0		0									
12:30:00	419	0.08	15	5	1	0		0									
12:32:30	403	0.08	15	7	1	0		0									
12:34:20	609	0.08	15	2	1	0		0									END R5 AT POINT A FL025
12:35:15	390	0.08	16	2	1	0		0									START P7
12:35:57	371	0.08	16	5	2	0		0									FL030
12:36:58	366	0.09	16	2	1	0		0									FL040
12:37:52	350	0.08	16	2	1	0		0									FL050
12:38:14	410	0.08	16	10	2	0		0									FL055 END P7
12:39:50	358	0.08	16	0	0	0		0									START R6 B-C
12:42:00	391	0.08	16	8	0	0		0									
12:44:00	290	0.08	16	0	0	0		0									
12:46:00	225	0.09	16	2	1	0		0									
12:47:20	210	0.09	16	2	1	0		0									OVER
12:50:00	329	0.08	16	2	1	0		0									
12:50:48	315	0.08	16	2	1	0		0									END RUN 6
12:53:00	416	0.09	16	2	1	0		0									
12:53:40	266	0.08	16	2	1	0		0									START P8 @ FL055
12:54:18	171	0.08	16	2	0	0		0									FL060
12:55:25	364	0.09	16	2	2	0		0									FL070
12:55:52	24	0.10	16	2	0	0		0									FL080
12:56:30	26	0.14	16	10	0	0		0									FL085
12:57:34	17	0.10	16	1	0	0		0									FL090
12:58:06	17	0.08	16	2	0	0		0									FL095 END PROFILE 8
13:00:00	17	0.09	16	1	0	0		0									
13:00:57	21	0.07	16	1	0	0		0									START PROFILE 8
13:01:33	20	0.22	16	20	2	0		0									FL100
13:02:30	16	0.08	16	0	0	0		0									FL110

CLOUD PHYSICS LOG Flight B312

Date: 26/07/07	Operator: KFT	DRS Time: 09:35:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 3 of 3

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
13:03:35	20	0.08	16	0	0	0		0									FL120 END PROFILE 8
13:04:09	19	0.08	16	0	0	0		0									START PROFILE 8
13:05:25	10	0.08	16	8	0	0		0									FL130 PCASP radius v variable
13:06:30	11	0.18	16	2	0	0		0									FL140
13:07:05	40	0.20	16	0	0	0		0									FL145 INTERRUPT PROFILE
13:09:00	60	0.10	16	1	0	0		0									FL150
13:10:00	39	0.08	16	0	0	0		0									FL160
13:11:00	77	0.09	16	0	0	0		0									FL170
13:11:59	28	0.08	16	0	0	0		0									FL180
13:13:00	45	0.09	16	0	0	0		0									FL190
13:14:00	17	0.08	16	0	0	0		0									FL200
13:15:00	8	0.12	17	0	0	0		0									HOLD AT FL200
13:18:26	12	0.08	17	0	0	0		0									FL220
13:19:53	10	0.07	17	0	0	0		0									FL230
13:20:53	5	0.10	17	0	0	0		0									FL240
13:21:57	9	0.15	17	0	0	0		0									FL250
13:22:59	11	0.09	17	0	0	0		0									FL260 END PROFILE 8
13:23:23	11	0.09	17	1	0	0		0									Start profile 9
13:24:29	11	0.09	17	0	0	0		0									FL250
13:25:35	10	0.11	17	0	0	0		0									FL240
13:26:31	14	0.09	17	0	0	0		0									FL230
13:28:25	12	0.09	17	0	0	0		0									FL210 FFSSP BASE/ANNULUS INCREAS'D
13:29:24	31	0.08	17	0	0	0		0									FL200
13:30:36	62	0.10	17	0	0	0		0									FL190 POLLUTION LAYER
13:31:45	20	0.11	17	0	0	0		0									FL180
13:32:50	54	0.10	17	0	0	0		0									FL170 POLLUTION Layer
13:33:59	37	0.08	17	0	0	0		0									FL160
13:34:57	31	0.08	18	0	0	0		0									FL150
13:35:35	100	0.10	27	1	0	0		0									FL152
13:36:26	37	0.08	460	0	0	0		0									FL160 FFSSP BASEINCR. SYNCH'D
13:37:41	62	0.09	1501	1	0	0		0									FL155
13:39:00	121	0.09	1501	1	0	0		0									PCASP 80-120/CC
13:40:30	60	0.09	1502	0	0	0		0									
13:41:00	23	0.10	1502	0	0	0		0									
13:42:00	17	0.10	1503	0	0	0		0									
13:43:00	23	0.09	1506	0	0	0		0									TENUOUS POLLUTION LAYER
13:43:47	34	0.09	1509	0	0	0		0									END RUN 7, START PROFILE 11
13:44:30	166	0.11	1514	0	0	0		0									FL150
13:45:41	16	0.08	1518	0	0	0		0									FL140
13:46:42	18	0.22	1520	8	0	0		0									FL130 DUST LAYER
13:47:19	28	0.15	1541	20	1	0		0									FL125
13:47:50	13	0.08	1551	0	0	0		0									FL120
13:48:43	19	0.20	1580	20	0	0		0									FL110
13:49:50	38	0.25	2640	20	0	0		0									FL100 FFSSP RESTARTED
13:52:00	11	0.0	5	0	1	0		0									
13:52:55	23	0.25	0	20	1	0		0									

CLOUD PHYSICS LOG Flight B312

Date: 26/07/07	Operator: KFT	DRS Time: 09:35:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 4 of 4

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
13:54:00	17	0.20	0	20	1	0		0									
13:54:36	21	0.08	0	1	1	0		0									
13:55:00	14	0.08	0	0	0	0		0									END RUN 8, START R12 FROM FL100
13:55:55	14	0.09	0	1	0	0		0									FL090
13:56:50	22	0.08	0	5	0	0		0									FL080
13:57:41	32	0.12	0	8	0	0		0									FL075
13:58:11	15	0.08	0	5	1	0		0									FL070 FFSSP BASE INCREASED
13:59:11	24	0.07	0	0	0	0		0									FL060
13:59:53	71	0.08	0	1	0	0		0									FL055 END PROFILE, START RUN 13
14:00:00	273	0.08	0	2	1	0		0									
14:02:00	261	0.08	4	8	1	0		0									PCASP UPTO 500/CC
14:02:30	356	0.08	44	2	1	0		0									
14:03:30	288	0.08	183	1	1	0		0									FFSSP RESTARTED
14:06:00	352	0.08	0	1	0	0		0									
14:09:00	33	0.08	0	0	0	0		0									
14:10:00	44	0.08	0	5	0	0		0									
14:11:00	358	0.08	0	10	1	0		0									
14:12:00	134	0.08	0	5	1	0		0									
14:13:00	278	0.08	0	2	1	0		0									
14:14:00	257	0.08	0	2	1	0		0									
14:15:00	263	0.08	0	2	1	0		0									
14:17:00	338	0.08	0	2	1	0		0									END RUN9.2
14:18:22	374	0.09	0	2	1	0		0									FL050
14:19:22	326	0.08	0	2	1	0		0									START RUN10 AT FL050
14:21:00	438	0.08	0	4	1	0		0									
14:23:00	356	0.08	0	4	1	0		0									
14:25:00	453	0.08	0	2	1	0		0									
14:30:00	28	0.08	1	0	0	0		0									
14:32:00	304	0.08	1	2	1	0		0									
14:33:43	366	0.08	1	2	1	0		0									END RUN 10.1, FL050
14:35:26	439	0.08	1	4	1	0		0									START RUN 10.2
14:37:00	235	0.08	1	2	1	0		0									
14:39:00	21	0.07	1	0	0	0		0									PCASP conc seems to correl with turbulence
14:41:00	138	0.09	1	2	1	0		0									
14:43:00	153	0.08	1	2	0	0		0									
14:45:00	286	0.08	1	4	1	0		0									
14:47:00	305	0.08	1	4	1	0		0									
14:48:25	172	0.08	2	2	0	0		0									END RUN 10.2
14:50:18	165	0.08	2	1	0	0		0									START RUN 11.1 AT FL055
14:52:00	342	0.08	2	1	0	0		0									
14:54:00	193	0.08	2	2	1	0		0									
14:57:00	384	0.08	2	2	1	0		0									
15:02:00	156	0.08	2	4	0	0		0									PCASP Vref ~8.1V
15:04:00	127	0.08	3	2	1	0		0									End run 11
15:05:00	18	0.09	3	0	0	0		0									FL070
15:09:00	30	0.13	3	5	0	0		0									FL075

CLOUD PHYSICS LOG Flight B312

Date: 26/07/07	Operator: KFT	DRS Time: 09:35:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 5 of 5

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
15:09:37	23	0.08	3	2	0	0		0									FL070
15:10:37	65	0.09	3	1	1	0		0									FL060
15:11:10	306	0.08	3	5	1	0		0									FL055 START RUN
15:13:21	165	0.08	3	1	1	0		0									OVERHEAD SUPERSITE M
15:16:13	398	0.08	3	5	-	0		0									OVERHEAD SUPERSITE, SID2 RESTART
15:17:55	368	0.09	3	2	0	0		0									OVERHEAD SUPERSITE R
15:19:00	579	0.08	4	5	1	0		0									
15:19:19	628	0.08	4	2	1	0		0									FL050
15:20:17	773	0.09	4	8	1	0.5	800	0								8,5	FL040
																	FL030
																	FL020

Revision date: 22/08/2007 8:14 AM

CLOUD PHYSICS PROCESSING LOG

Flight number: **B312** **T/O:** 10:52:34
Date of flight: 26/07/07 **Land:** 15:24:19

A) FFSSP PROCESSING		To Exeter
Processing Stage	Done?	Comments
1) Transfer *.txt files from DVD to processing PC		
Bnnn_FFSSP_hh.txt for each hour of data Bnnn_FFSSP_HVMS.txt		**hh =** **Last sec processed =**
2) FTP the files (ascii) from the PC to directory PMSDATA: on FLOODS		**File size =**
3) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FSSP_EXTRACT_TAS** a) Flight number: **Bnnn** b) Path name: **MFDDATA:Bnnn_MFDX** c) Output directory: **PMSDATA:** d) Start time: *0 if unknown (see comment box)* e) End time: *240000 if unknown*		Use time just before/after take-off/landing. If T/O /landing just after/before the hour, ensure start/end time is before/after the hour if there is an FFSSP_hh.txt file for that hour.
4) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FFSSP_PROCESS_TXT** a) Flight number: **Bnnn** b) Directory: **PMSDATA:** c) TAS in processing: **Y** d) Vel threshold (clicks) **0** e) Calibration file: *Use the most recent calibration file.* Format FFSSP_CALddmmyyyy.txt Calibration files to be stored in MRFB:[PMS.FAST_FSSP] f) Adjust FFSSP time **Y/N** g) If Y, enter value to add to data time (seconds)		**Total glitches =** **Sec file written ok?** **Note calibration file used** Yes only if gross errors occur in FFSSP time eg; ~ 1hour
5) FLOODS> **WAVE** a) WAVE> **write_procffssp_to_m5,'pmsdata:Bnnn_procffssp.dat', 'mfddata:Bnnn_mfdX','pmsdata:Bnnn_m5procffssp',/auto** b) WAVE> **exit**		Use PVWAVE for this section **Note time correction applied to FFSSP by /auto =**
6) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5procffssp** b) Dataset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY (y=x+1)** d) Parameter description file: *leave blank to use default*		**Input file size =** **M5 output file size =**
7) CHECKS: i). Are FFSSP and JW/Nevzorov LWC synchronized in time? *In flight_plot, parameters* *JW LWC para 535* *Nevzorov LWC para 602* *FFSSP LWC para 1202* ii). If not, repeat from step 5b replacing /auto with **addt=x** which adds x+20 secs to FFSSP time.		**Synchronized?**

CLOUD PHYSICS PROCESSING LOG

Flight number: **B312**
Date of Flight: 26/07/07

B) 2D PROCESSING		REPROCESS +1hr
Processing Stage	Done?	Comments
1) Transfer Bnnn.dat file from CD/DVD to PC	Y	
2) Zip up file on PC (Bnnn.zip)	Y	
3) FTP the zipped file (binary) from the PC to the directory SEADAS_DATA:[SEADAS_DATA] on FLOODS	Y	11500 blocks
4) Log on to FLOODS		
5) Unzip SEADAS_DATA:[SEADAS_DATA]Bnnn.zip	Y	**Size of Bnnn.dat = 118606**
6) FLOODS> **WAVE**	Y	Use PVWAVE for this section
WAVE> **CONVERT_SEADAS_FILE** a) Input file: **SEADAS_DATA:[SEADAS_DATA]Bnnn.dat** b) Output file: **SEADAS_DATA:[SEADAS_DATA]Bnnn_seadas.dat** WAVE> **exit**		**Blocks read = 34488** **Blocks written = 34488** **Bad reads = 0**
7) FLOODS> **RUN MRFB:[PMS.SEADAS]READM200_FILE**	Y	
a) Default directory: **PMSDATA:** b) Flight number: **Bnnn** c) Disk file name: **SEADAS_DATA:[SEADAS_DATA]Bnnn_seadas.dat** d) Comment string: e) Start time: *0 if unknown (T/O – 5 min)* f) End time: *240000 if unknown (Land + 5 min)* g) Read 2DC: **Y** h) Read 2DP: **Y** i) Secondary data: **Y** j) FSP-SYNC: **Y** k) cmd.str: **Y** l) Auto time correction: **N** m) Full length secondary:**N**		**Start = 104500** **End = 153000** Ignore error message scroll (vestigial error from tapes) **Are FRW, FSP, IMB, PCA,SEC files in PMSDATA? Y Are they non-zero in size?** _aux 0 blocks
8) FLOODS> **WAVE**	N	2D image display and printing
i). WAVE> **imagedisplay** a) 2D directory name: **PMSDATA:** b) Flight number: **Bnnn** c) File generation no: **0** d) Time from IWC plot: **N** e) Select probe: (**1**) 2DC (**2**) 2DP f) Start time: *As in 7e above* g) End time: *As in 7f above* h) Time interval (sec): **5** recommended (0 for all images)		Must be done from FLOODS itself. **Note any problems with images** No images on 2dc or 2dp
ii). WAVE> **auto_image** a) 2D directory name: **PMSDATA:** b) Flight number: **Bnnn** c) Enter date: **YYYYMMDD** d) Enter start time: *0 if unknown (T/O – 1 min)* e) Enter end time: *240000 if unknown (Land – 1 min)* f) Enter time interval (sec) between successive imaged blocks: **10**		Prepare imagery for Core data From own PC again **Start =** **End =**
iii). WAVE> **exit** to create files		FAAM_YYYYMMDD_R0_ Bnnn_2Dx-images.ps
iv). FTP ascii *.PS files from PMSDATA: to PC		Notes on this in instructions
v). Load each into Ghostview or other pdf-converter		
vi). Output as pdf file (720 dpi resolution), appending name prefix of **CORE-CLOUD-PHY**_ to converted files		

9) FLOODS> **RUN MRFB:[PMS.SPEC2D.AUTO]PROCESS2D_AUTO** a) Flight number: **Bnnn** b) Directory: **PMSDATA:** c) File generation: *Hit enter* d) Time correction: *Time offset of the 2D data* e) TAS: **Y** f) MFD directory: **MFDDATA:Bnnn_MFDX** g) Probe number: (**1**) 2DC (**2**) 2DP (**0**) Both *0 unless either probe known to be faulty* h) Start time: *0 if unknown (T/O + 30sec)* i) End time: *240000 if unknown (Land – 30sec)* j) Nominal averaging: **0.2** seconds for conversion to M5 k) Particle type 2DC: **8** if known to be in ice cloud **11** if known to be in water cloud l) Particle type 2DP: **8** if known to be in mixed-phase **8** if unknown m) Coefficient choice: **2** n) Output root filename: **PMSDATA:Bnnn_PROC2D**	N	NB. an error message may appear, floating point exception, rerun and use time quoted in error message, repeat until successful. **X =** **Start =** **End =** **Time data processed to =** **2dproc files present?** *.2dc, *.2dp and *.dat
10) FLOODS> **WAVE** i) WAVE> **WRITE_PROC2D_TO_M5, 'PMSDATA:BNNN_PROC2D.DAT', 'PMSDATA:BNNN_M5PROC2D'** ii). **exit**	N	Use PVWAVE for this section Error message about HDDR file should be ignored. **Records =**
11) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5proc2D** b) Datset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY** d) Parameter description file: leave blank to use default	N	 **X =** **Y = (X+1)**
12) CHECKS: Are 2DC/2DP IWC of comparable magnitude and well-correlated with Nevzorov TWC? *In flight_plot, parameters* *Nevzerov TWC para 605* *2DC IWC para 1302* *2DP IWC para 1312*	N	 **Correlated?**

CLOUD PHYSICS PROCESSING LOG

Flight number: **B312**
Date of Flight: **26/07/07**

C) PCASP PROCESSING		
Processing Stage	Done?	Comments
1) Complete stage 7) in 2D processing Ensures Bnnn_FSP.DAT containing raw PCASP data is written to directory PMSDATA:	**Y**	
2) FLOODS> **RUN MRFB:[PMS.PCASP]PROCPCASP_NEW** a) Flight number: **Bnnn** b) File name: **PMSDATA:Bnnn_FSP.DAT** c) Root output name: **PMSDATA:Bnnn_PROCPCASP** Produces PMSDATA:Bnnn_PROCPCASP.DAT (binary) PMSDATA:Bnnn_PROCPCASP.OUT (ascii) d) Minimum size channel: *default = 1* *If smallest size channel are known to be noisy the value of the highest noise free channel to be entered here* e) Calibration volume flow rate: *Use the most recent value. (1.15ccs^{-1} Feb 07)* *Calibration files to be stored in **Exeter*** *Entering zero gives default value = 1.0 cm^{3}s^{-1}* f) Time correction: *Same value as used in 2D processing stage 9d* g) Start time: *0 if unknown* h) End time: *240000 if unknown*	**Y**	**Min size = 1** **Vol flow rate =** 1.0 105200 152500
3) FLOODS> **WAVE** i).WAVE> **write_procpcasp_to_m5, 'pmsdata:Bnnn_procpcasp.dat', 'pmsdata:Bnnn_m5procpcasp'** ii). WAVE> **exit**	**Y**	Use PVWAVE for this section
4) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5procpcasp** b) Dataset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY** d) Parameter description file: *leave blank to use default*	**Y**	**X = _tas** **Y = X+1 = _tas_pcasp**
5) CHECKS Are PCASP and JW peaks synchronous? *In flight_plot, parameters* *Neph – total blue scatter.* *PCASP conc para 1550*	**N**	Data present in _tas_pcasp **Merged OK?**

Wet Nephelometer Log

Flight No **B**312 Date 26/07/07 Operator's name: D. TIDDEMAN Page 1 of 2

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
105969	—	—	12.7	18.8	36.2	10°	25°	Humidifier On
11:06 57	Run1	2500	14.2	41.2	36.4	↗40°	12°	~~35.4 39.4~~
11:11 45	"	"	14.1	40.9	68.6	↗45°	40°	~~42.2 31.5~~
11:14 42	"	"	14.1	42.2	81.9	↘15°	45°	~~40 40 40.4~~
112020	"	"	14.1	41.9	51.3	↘15°	25°	Pre Heater On ~~35.0 23.4~~
112534	Run2	5500	12.8	38.0	39.5	↗45	15°	50 ~~40~~ 40.7
113311	"	"	9.9	23.6	82.7	↘20°	45°	
114127	Run3	2500	10.9	37.6	48.8	↗45°	20°	
114732	"	"	10.9	42.9	86.4	↘20°	45°	
~~121~~ 120841	Run4	5500	13.6	16.1	32.6	↗45°	20°	
122035	Run5	2500	15.0	39.3	85.0	↘15°	45°	
127870	"	"	15.0	39.3	50.8	↗45°	15°	
123828	—	5500	13.5	32.4	87.4	↘15°	45°	
124315	Run6	5500	13.5	35.0	58.7	↗45°	25°	
124930	"	"	13.6	29.8	86.4	↘40°	45°	
125130								Pre Heater Off
130607	Profile	13500	10.2	18.7	73.2	↘20°	40°	
1311								Laptop crashed (Blue screen of death)
1324								Laptop back up and talking ...
133753		15500	11.4	9.8	33.1	10°		Humidifier On

Wet Nephelometer Log

Flight No **B**...312..... Date 26/07/07 Operator's name: D. Tiddeman Page 2 of 2

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
134115	Run 7	155	11.3	7.3	25.8	↗35°	12°	
135115	Run 8	100	13.7	13.5	56.6	↗45°	35°	
135334	"	100	13.7	13.8	81.2	↘15°	40°	
140015	Run 9.1	5500	13.8	23.3	40.5	↗45°	20°	
140434	Run 9.2	"	13.7	30.5	83.3	↘15°	45°	
141130	"	"	13.9	31.8	44.2	↗45°	19°	
141860	Run 9.3	5000	13.9	35.4	86.0	↘25°	45°	
142316	Run 10	"	14.1	37.3	57.3	↗45°	25°	
142750	"	5000	14.0	26.2	88.5	↘25°	45°	
143234	"	"	14.0	31.1	57.1	↗45°	25°	
143688	Run 10.2	"	13.9	40.3	88.9	↘15°	45°	
144229	"	"	14.1	38.6	53.3	↗45°	21°	
145030	Run 11	5500	13.8	26.2	87.2	↘20°	45°	
145740	"	"	13.7	36.6	51.3	↗45°	20°	
150421	"	"	13.7	14.5	89.1	—	45°	Humidifier off

B312 CVI log

7/26/07 10:59:37 AM
7/26/07 11:00:21 AM
7/26/07 11:05:14 AM r1 2500ft clear air
7/26/07 11:16:30 AM cloud physics at half pcasp counts
7/26/07 11:19:42 AM eor1
7/26/07 11:25:25 AM r2 @ 5500 clear air
7/26/07 11:37:14 AM eor2
7/26/07 11:41:34 AM r3 2500ft
7/26/07 11:55:21 AM eor4
7/26/07 11:55:34 AM eor3
7/26/07 11:55:49 AM Still clear of cloud.
7/26/07 11:56:15 AM p4
7/26/07 12:04:11 PM profile decent p5 9500ft to ?
7/26/07 12:08:11 PM r4 5500ft
7/26/07 12:16:22 PM eor4
7/26/07 12:20:57 PM r5 2500ft
7/26/07 12:34:28 PM eor 5
7/26/07 12:40:13 PM r7 5500ft
7/26/07 12:40:26 PM oops r6
7/26/07 12:51:05 PM eor6 clear air
7/26/07 12:58:46 PM eo profile at 9500ft
7/26/07 1:02:28 PM
7/26/07 1:23:18 PM fl260
7/26/07 1:23:49 PM profile decent p9 to fl150
7/26/07 1:24:33 PM There has been some thin polution layers all the way up to 26000ft
7/26/07 1:44:30 PM eor & profile decent to 10000ft
7/26/07 1:55:32 PM larger particles seen in polution layer at 10000 run just finished
7/26/07 2:00:11 PM r9 @ 5500ft
7/26/07 2:02:15 PM
7/26/07 2:03:40 PM eor9
7/26/07 2:17:57 PM eor9.2
7/26/07 2:18:10 PM decent to 5000ft
7/26/07 2:19:41 PM r10 5000ft
7/26/07 2:34:18 PM eor 10.1 5000ft clear air for all run
7/26/07 2:35:48 PM r10.2 5000ft
7/26/07 2:48:47 PM eor 10.2, climg to 5500ft
7/26/07 2:50:46 PM r11 5500ft
7/26/07 3:05:03 PM eor 11, climb before supersite runs and landing.

Flight: B312

KEY

- Not Fitted
- Fitted, Not Operated
- Duff Data
- Minor Problems
- OK

Thermometers
- Cabin Temperature:
- Heimann:
- Deiced Temp:
- Non-deiced Temp:

Hygrometers
- FWVS:
- General Eastern:
- Johnson Williams:
- Nevzorov:
- Total Water Probe:

Cameras
- Downward Facing:
- Forward Facing:
- Rearward Facing:
- Upward Facing:

Navigation + Aircraft
- Cruciform GPS:
- GIN Applanix:
- INU Honeywell:
- Radar Altimeter:
- RVSM IAS:
- RVSM Static Pressure:
- XR5 GPS:

Report Created 20/08/2007 17:28:46

Misc Core
- AMTG:
- AVAPS:
- Cabin Pressure:
- Fax machine:
- Printer:
- S9 Static Pressure:
- Satcom C:
- Satcom H:
- Turb Centre-Static:
- Turb Left Right:
- Turb Up-Down:
- Turb Horizontal Chk:
- Turb Vertical Chk:
- Weather Radar:

DLUs:
- DLU AERACK:
- DLU BBR Lower:
- DLU BBR Upper:
- DLU Core Chem:
- DLU Core Consoles:
- DLU Port Aft:
- DLU Port Fwd:
- DLU Stbd Fwd:

Radiometers
Lower:
- BBR (clear) Lower:
- BBR (IR) Lower:
- BBR (red) Lower:

Upper:
- BBR (clear) Upper:
- BBR (IR) Upper:
- BBR (red) Upper:

- ARIES:
- DEIMOS:
- IR Camera:
- JNO2 Lower:
- JNO2 Upper:
- JO1D Lower:
- JO1D Upper:
- MARSS:
- SHIMS Lower:
- SHIMS Upper:
- SWS:
- TAFTS:

Last Updated: 01/08/2007 12:59:21

Cloud Probes
- 2DC:
- 2DP:
- FFSSP:
- PCASP:

- ADA:
- CCN:
- CDP:
- CIP 100:
- CIP 25:
- CPI:
- CVI:
- SID1:
- SID2:

Aerosol
- CPC 3025A:
- Filters 47mm:
- Filters 90mm:
- Neph - Dry:
- Neph - Wet:
- PSAP:
- AMS:
- CPC 3025 (AMS)
- INC:
- VACC:
- CPC 3010A (CVI):

Chemistry
- CO Aerolaser 5002:
- NOx TE42C:
- Ozone TE49C:
- Ozone TE49:
- SO2 TE43C:
- TDLAS (NIR) CH4:
- TDLAS (NIR) CO2:

- FAGE:
- Formaldehyde:
- NOxy:
- ORAC:
- PAN:
- PERCA:
- Peroxide:
- PTRMS:
- TDLAS (1C):
- WAS Bags:
- WAS Bottles:

Misc Non-Core
- CASI/ATM:
- LIDAR:
- LTI:
- SAW Hygrometer:

Faults / Incidents Log

Flight No. B312
Date: 26/07/2007

Instruments

1. Wet Nephelometer – pc crashed around 1316Z Rebooted and working again after ~ 20 minutes.
2. TWC – status light came on at FL260, +2.5C outside, Status word 4091, Para 72 TSAM out of limits (640) , TSAM reading 508 DRS units. Also, Para 75 EVAP 1 below limit (2110), reading 2090 DRSU.
3. Satcom C –occasional messages "satcom not available" when option 5 selected from satcom menu. Otherwise okay.
4. Copsfaam account on Outlook Express not working. Can access account through Internet Explorer okay though.

Aircraft

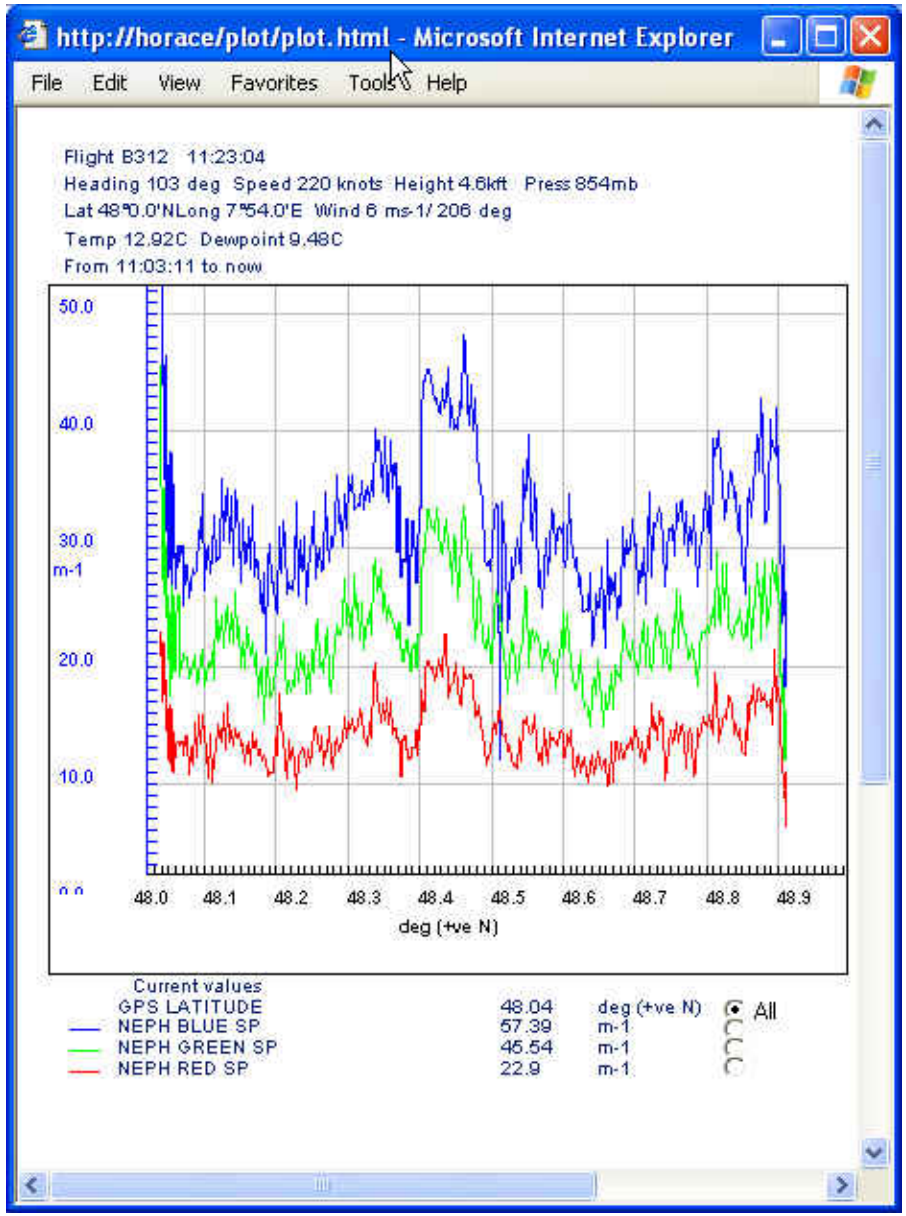
1.

Satcom-H Calls

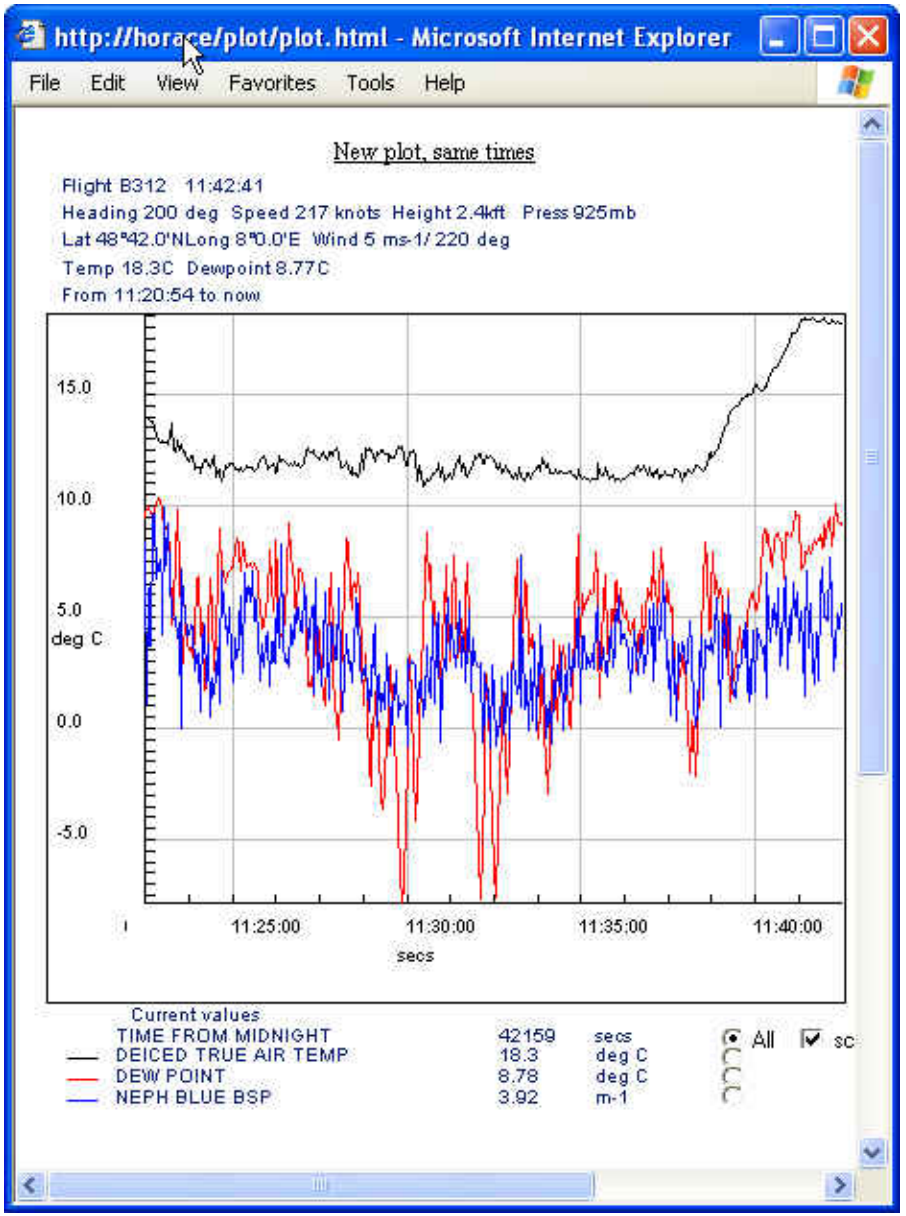
Hornisgrinde

Post Flight - Turb Probe Water Traps

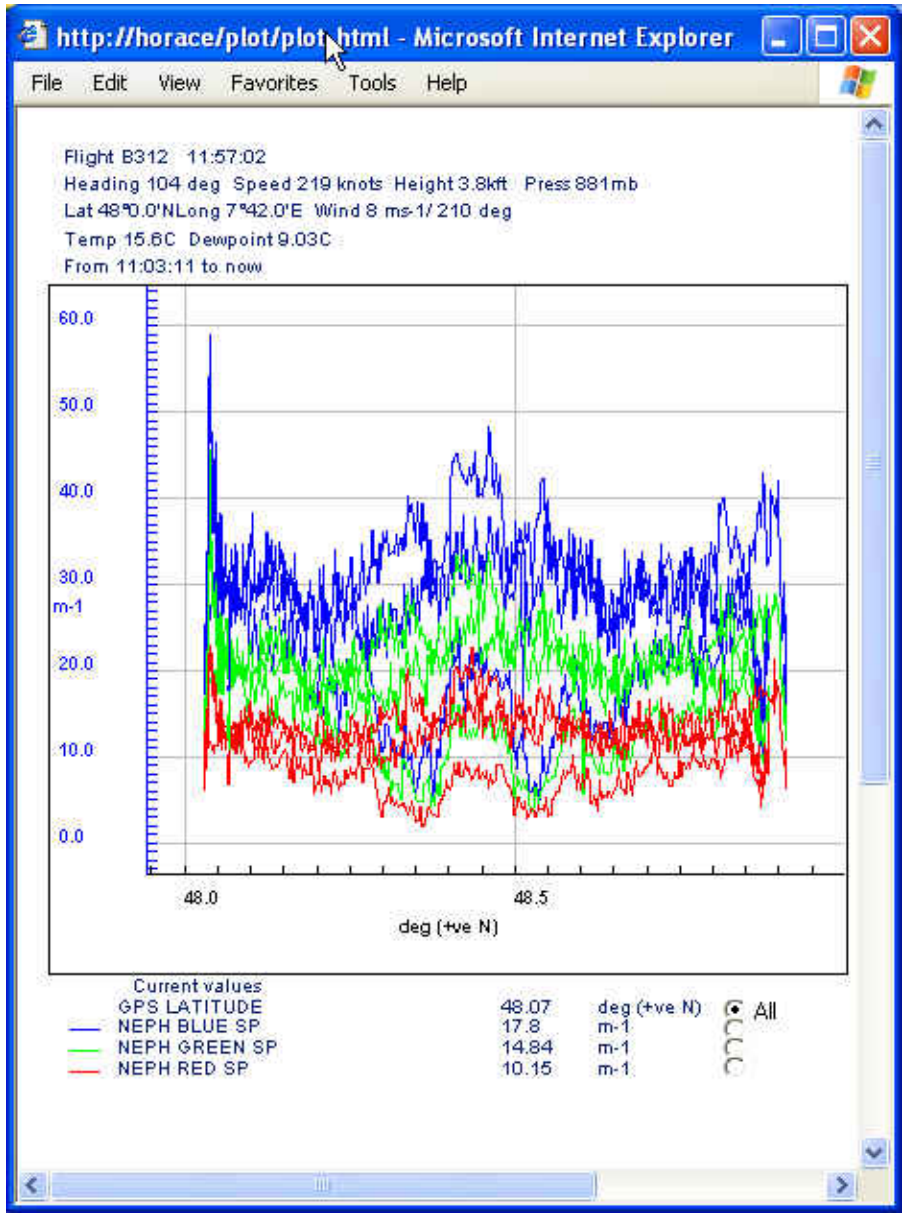
1. Indicate Amount of Water: a) Nil b) 1-2 drops c) ¼ full or more d) Ice present
2. Emptied by:
3. Dried by:



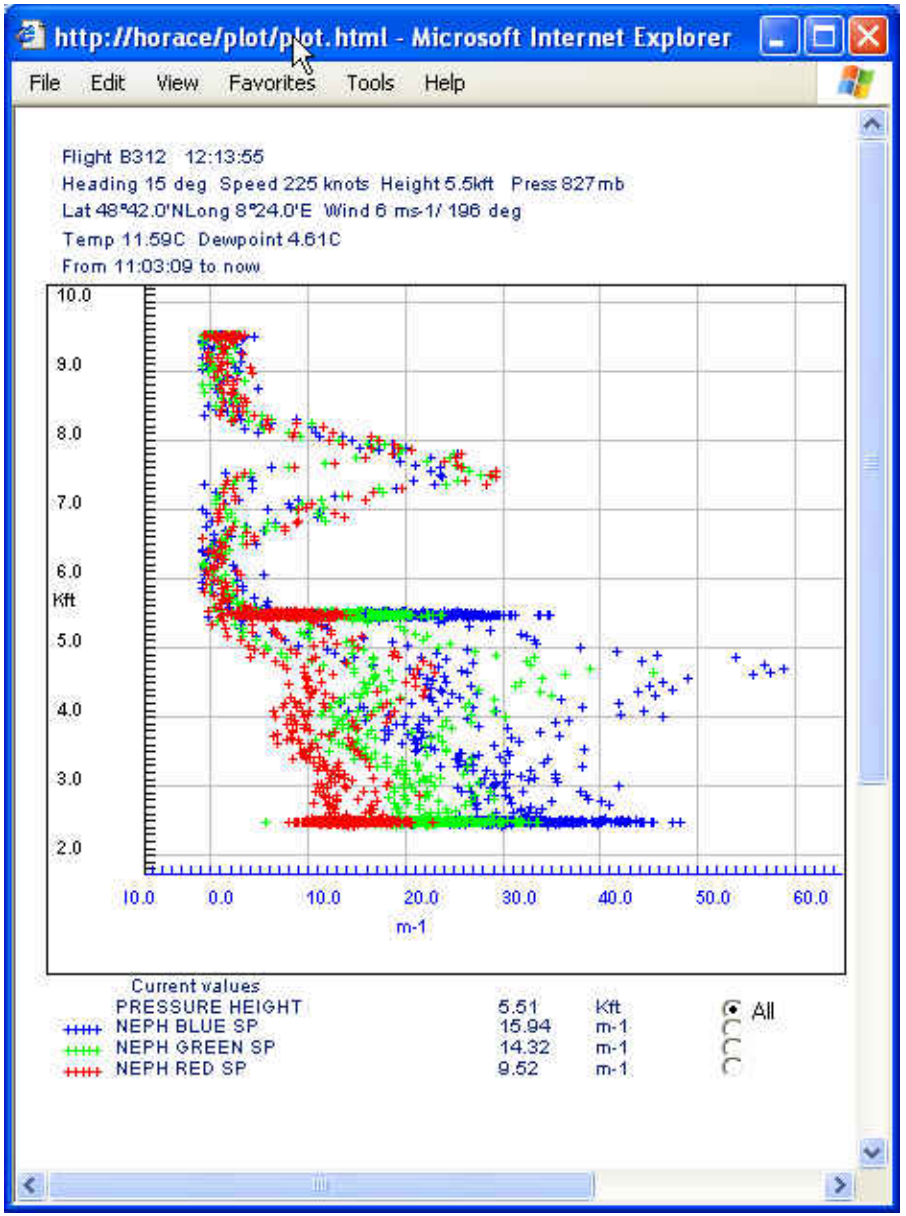
B312nephin nvalley1100R1



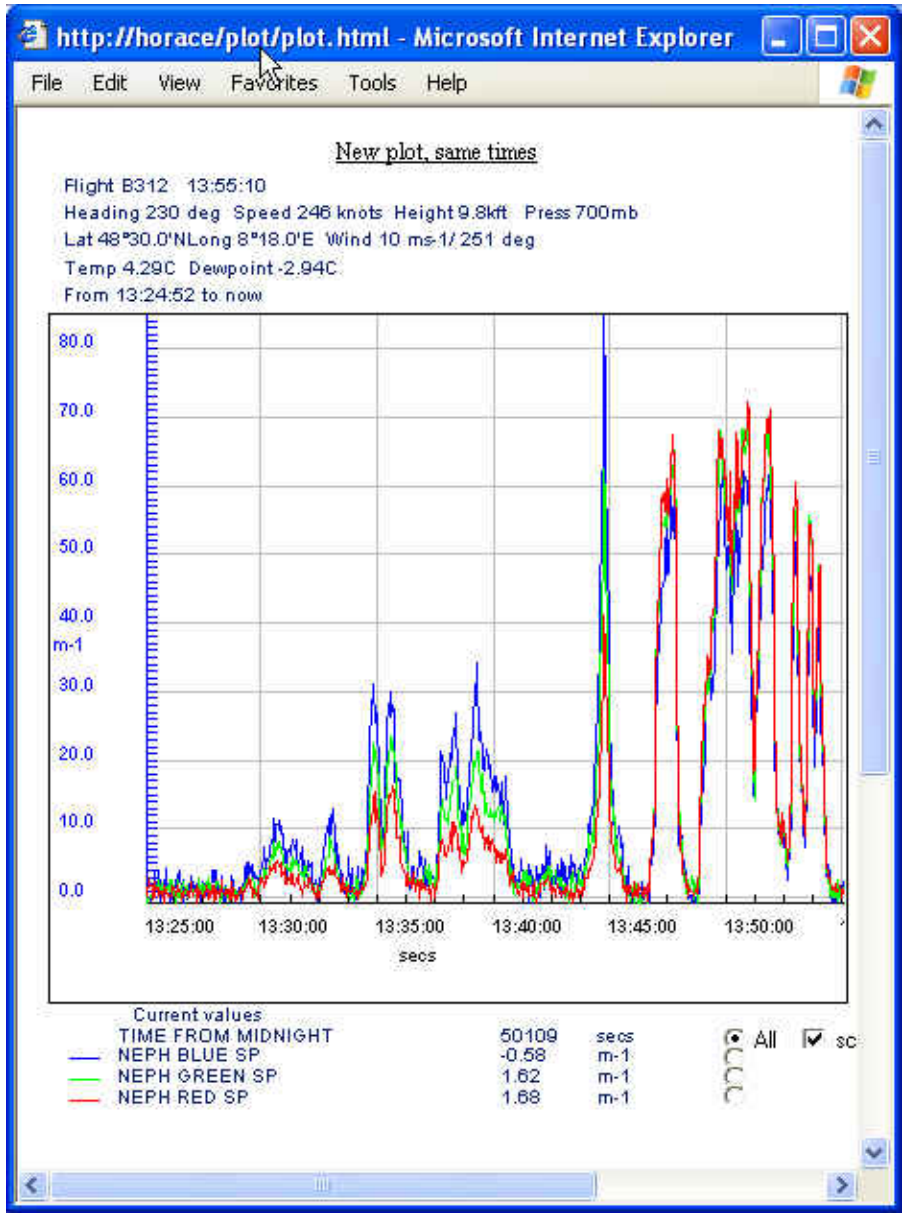
B312r2ttdnephoverBFrun2_5K



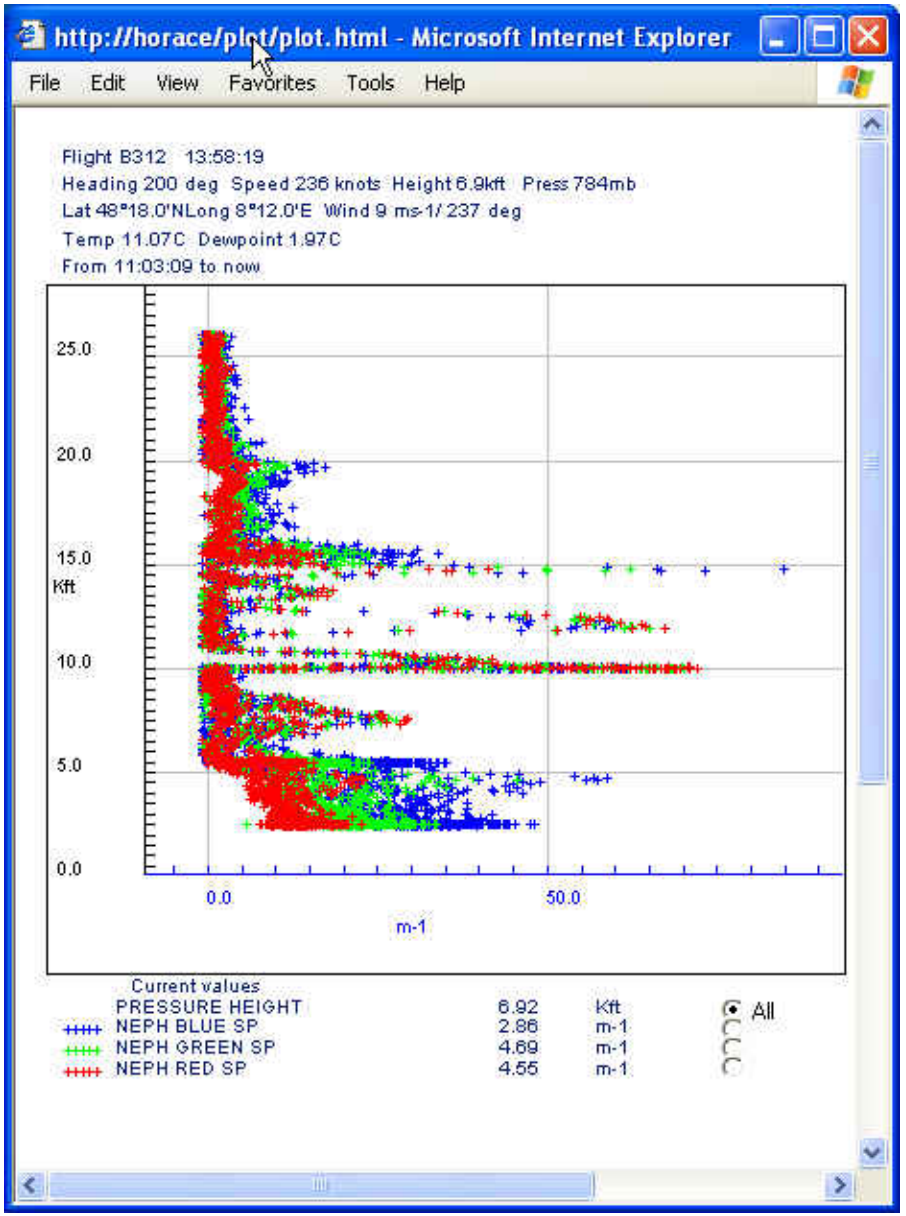
B312nephin nvalley1150R3



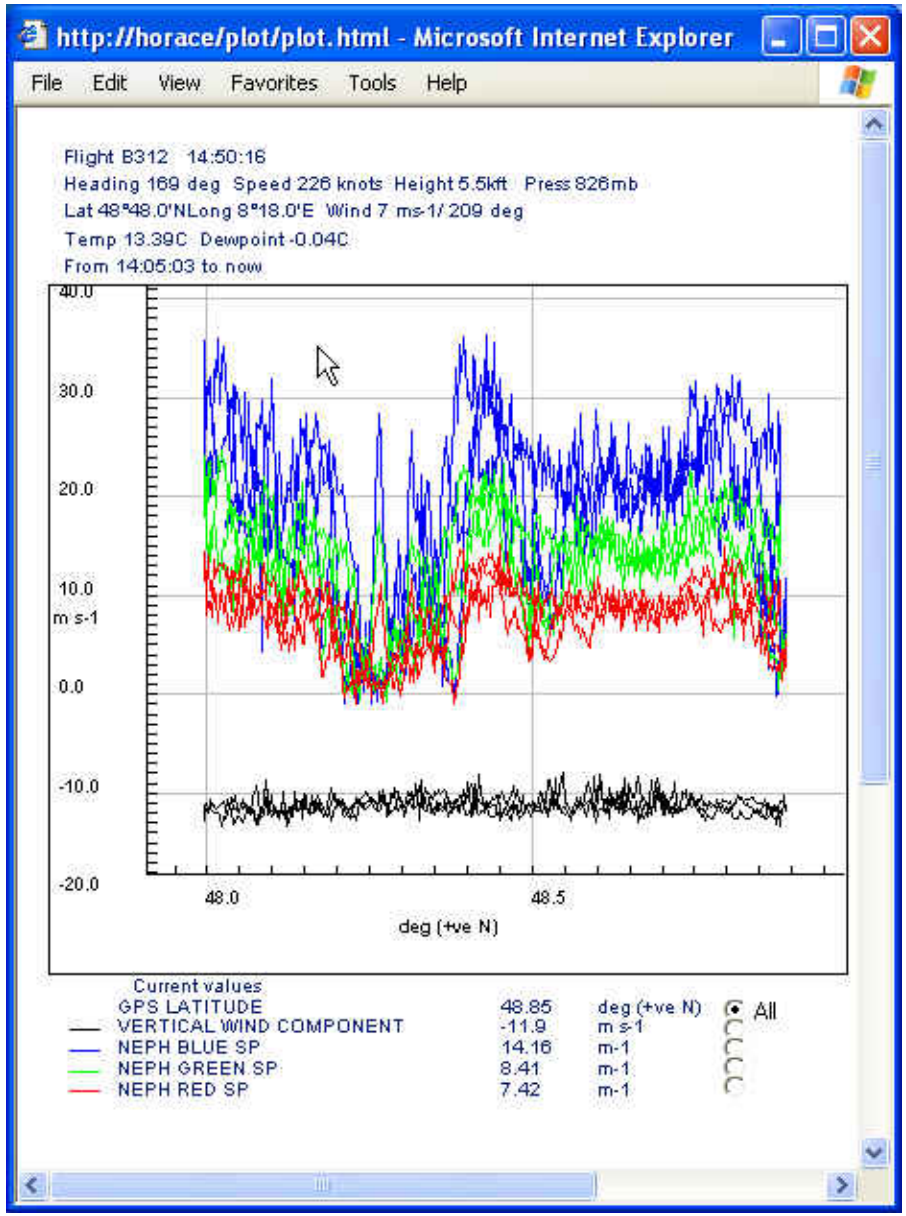
B312p5overptBdustlayer



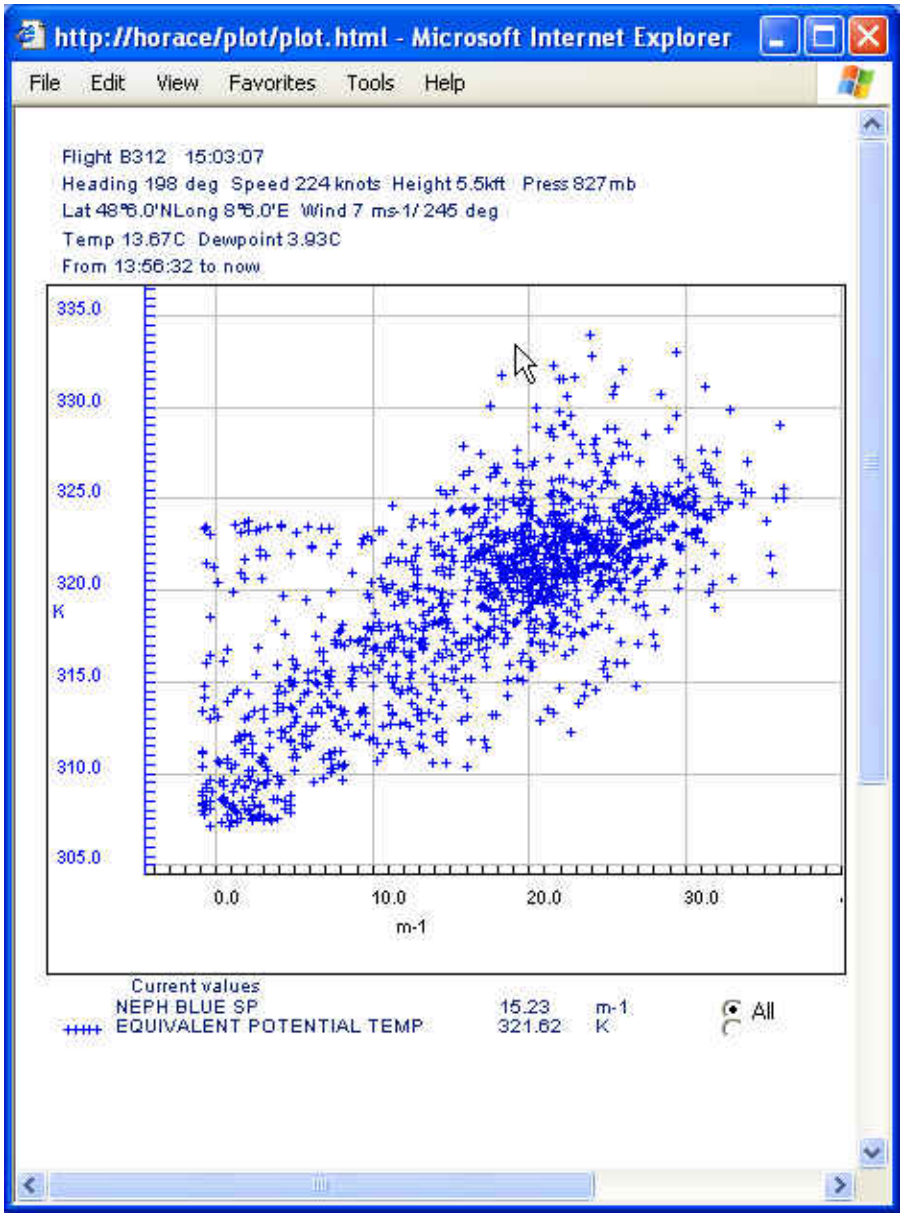
B312nephtimeindeepprofile



B312nephdeepprofile



B312nephw_slr_overBF



B312nephvsThetaqoverBF

MISSING LOG SHEETS:

The following log sheets are not available for flight B312:

Log	Reason
Pre-flighter log	No log available
Core Chemistry	no In Flight log except in cases of instrument problems
VACC log	VACC operator does not create a log sheet
PSAP log	No log as PSAP pump/filter info included on Flight Summary page
AMS log	Log only of interest to instrument operator so no copy left with FAAM
CPI log	CPI operator does not create a log sheet

Document control

Revision	Date	Author	Comments
r0	23 Aug 2007	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

VIDEO RECORDINGS:

3 x Upward Facing Cameras
3 x Forward Facing Cameras

Digital8 video recordings from this flight reside with :

Professor Stephen Mobbs

Director, National Centre for Atmospheric Science
Environment Building, School of Earth and Environment
University of Leeds, Leeds LS2 9JT, United Kingdom

Tel: +44 (0) 113 3435158 / 6408
Fax: +44 (0) 113 3436499

E-mail: stebbs@faam.ac.uk